BEFORE THE ILLINOIS COMMERCE COMMISSION

INITIATIVE ON PLUG-IN ELECTRIC VEHICLES

SUPPLEMENTAL COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL

AUGUST 15, 2011

I. INTRODUCTION

The Natural Resources Defense Council ("NRDC") respectfully submits the following comments on behalf of our 19,454 members and online activists residing in Illinois. We commend the Illinois Commerce Commission ("Commission" or "ICC") and the utilities under its jurisdiction for taking up the critical and timely issue of the electrification of the transportation sector. Coupled with clean electricity, plug-in electric vehicles ("PEVs") have the potential to significantly reduce greenhouse gas emissions, improve air quality and reduce dependence on oil. Over the next five years, nearly all major automakers are planning to introduce PEVs into the U.S. market. In order to capture the full environmental, social, and economic potential of vehicle electrification, while minimizing associated costs, NRDC recommends the Commission adopt three over-arching policy goals:

1. *Reduce Barriers for Consumers to Own and Operate Plug-In Electric Vehicles*

   Utilities in early deployment regions, such as San Diego Gas and Electric, stress the importance of dedicated teams of experts who provide individualized assistance to customers making the switch to PEVs, and work with local permitting agencies, third-party charging service providers, building owners, and electrical contractors to facilitate a smooth consumer experience. The Commission should direct the utilities under its jurisdiction to conduct the preparations necessary to ensure a smooth deployment of PEVs within Illinois.

2. *Minimize Costs and Impacts Associated with Electrification*

   Ensuring that utilities, charging service providers, and customers have the tools to manage PEV load in an efficient, reliable, and environmentally preferable manner will be critical. Utilities need to be notified as to the location of new PEV load to prevent service interruptions, facilitate service planning, and allow for customer outreach. The Commission should consider policies that encourage utilities, Retail Electric Suppliers,

and third-party charging service providers to deploy tariffs, equipment, and services that support load management. These policies should include transparent price signals to all PEV customers that smooth out the load curve, smart charging iniatives, and demand response programs.

3. Maximize the Environmental, Utility Customer, and System Benefits of Plug-In Electric Vehicles

PEVs, if integrated appropriately, offer many potential benefits. For example, charged with clean energy, PEVs reduce greenhouse gas emissions and improve air quality. PEV adoption can also significantly reduce dependence on oil, and on fuels in general, as customers benefit from the efficiency inherent in electric drive vehicles. Finally, there are also potential electrical grid benefits from PEV charging, including greater utilization of existing assets which could lower the marginal cost of electricity for all users, the ability to provide grid support services that facilitate the integration of variable generation from renewable resources, and in the long term, vehicle-to-home or vehicle-to-grid applications that can reduce the cost of integrating distributed- and utility-scale renewable energy resources. The Commission should establish policy objectives that seek to maximize each of these potential benefits.

With these goals in mind, NRDC offers the following responses to the questions posed in the Commission's "Request for Supplemental Comments."

II. THE APPROPRIATE REGULATORY PARADIGM (IF ANY) FOR PRIVATE AND PUBLIC CHARGING STATIONS

In determining the appropriate regulatory framework, the Commission should differentiate between charging service companies that wish to procure at wholesale and those that simply wish to act as customers of utilities or Retail Electric Suppliers. We address these two distinct categories of companies separately.

A. Companies Wishing to Procure at Wholesale Should Certify as Retail Electric Suppliers

The Commission should make it clear that electricity procured at wholesale for PEV charging will be subject to the same requirements and regulations as electricity procured for any

other purpose. The California Public Utilities Commission made this clear in the first phase of its rule-making on electric vehicles, concluding as a matter of law:

> *If a provider of electric vehicle charging services procures electricity on the wholesale market the Commission has jurisdiction to enforce procurement requirements and other laws and rules that apply to direct transactions ...*[1]

In Illinois, a company wishing to procure at wholesale would likely best be served by certifying as a Retail Electric Supplier ("RES"). Commonwealth Edison ("ComEd") asserts that a statutory change may be needed to allow a utility or a RES to provide public charging services, because "electric utility" and "retail electric supplier" are both defined as serving "retail customers," and a "retail customer" is defined as a single entity at a single premise.[2] In ComEd's interpretation, serving multiple customers at a single premise is therefore prohibited. We note, without passing judgment as to the merits of either argument, that an alternative reading is also possible. An individual customer charging at a public station is still a single entity at a single premise, regardless of the presence of other entities. Accordingly, that customer is a "retail customer" and eligible for service from an electric utility or a Retail Electric Supplier serving multiple "retail customers." However the Commission resolves this matter, it should make it clear that electricity procured for vehicle charging will be subject to the same requirements as electricity procured for any other purpose.

B. Companies that Are Simply Customers of Utilities or Retail Electric Suppliers Should Not Be Regulated as if They Were Utilities or Retail Electric Suppliers

Any company offering *public* charging services would appear to be subject to the very broad language of the Illinois Public Utility Act, which confers jurisdiction over virtually any entity providing electricity to the public, unless exempted. However, a company that does not procure at wholesale should not be subject to the level of regulation appropriate for either a utility or a RES. Accordingly, a strong statement by the Commission or legislative action, or both, may be necessary to provide regulatory certainty. We note the fact the Illinois legislature deemed it necessary to create a statutory exemption from utility regulation for the provision of compressed

[1] California Public Utilities Commission, *Decision 10-07-044*, July 29, 2010, Conclusions of Law 5.

[2] ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 33.

natural gas for use in motor vehicles. We also note that several other states with similar statutory schemes have passed or are in the process of passing bills that create exemptions for the provision of electricity for use in motor vehicles.[3] However, there are differences in Illinois' code, largely due to the Restructuring Act, which could be read as obviating the need for further legislative action. In any case, some pronouncement that a company acting as a customer of a utility or a RES will not be subject to the same level of regulations as a company that procures at wholesale is needed.

C. Any Exemption from Regulation as a Utility or a Retail Electric Supplier, Legislative or Otherwise, Should Be Narrowly Tailored to Preserve the Commissions' Ability to Ensure the Environmental Performance, Safety, and Reliability of the Electrical Grid

Any pronouncement, regulatory or legislative, meant to exempt electric vehicle charging companies acting as customers of utilities or Retail Electric Suppliers from regulation as such should be narrowly tailored to ensure it does not limit the Commission's ability to meet its core obligations. The Commission should take care to maintain its ability to respond to a market that is likely to evolve in ways that cannot be anticipated. The Commission should likewise consider that the simple gas station analogy does not function well in this instance. Unlike gasoline or natural gas, electricity cannot be easily stored and the effects of its use are felt instantly throughout the distribution system. Similarly, companies operating gas stations do not also offer refueling services in their customers' homes, as many electric vehicle charging companies hope to do.

NRDC opposes the prescriptive approach taken by Washington House Bill 1571, which states: "The commission shall not regulate the rates, services, facilities, and practices of an entity that offers battery charging facilities to the public for hire…" At this nascent stage in the development of the charging services market, it is imprudent to tie the hands of future regulators. Rather, any exemption, regulatory or legislative, should simply state that charging electric vehicles does not alone render an entity subject to regulation as a utility or a RES.

[3] California Assembly Bill 631, 2011; Oregon Revised Statutes, Volume 17, 757.005(G); Washington House Bill 1571, 2011; Minnesota H.F. No. 1250. 2009.

D. Before any Exemption is Created, the Commission Should Identify Alternative Sources of Authority Upon Which it Will Rely to Ensure a Successful Integration of Plug-In Electric Vehicles

In determining the appropriate regulatory paradigm, the Commission should keep in mind the three overriding policy goals enumerated above and should consider its ability to effect the policies and actions necessary to meet such goals, including the following:

1. *Utility Notification*

   There is widespread agreement amongst parties that utility notification as to the location of planned charging station installations, in both the public and private contexts, is essential to minimize costs and facilitate a smooth integration of electric vehicle charging into the electrical grid. ComEd even asserts that notification should be required.[4]

2. *Time Variant Price Signals that Reach End-Users*

   Similarly, there is broad consensus that time-variant pricing will be a key tool in managing the electric vehicle load. However, the efficacy of such price signals will be greatly diminished if they do not reach end-users. The Commission should to consider how it will ensure that all end-users, including customers of Retail Electric Suppliers and customers of third-party charging service companies, see appropriate price signals, preferably at the point of decision making. The Commission may wish to consider whether or not time-variant price signals could be transmitted via the distribution portion of a customer's bill in order to reach both utility and RES customers.

3. *Price Transparency*

   When consumers buy gas, there is near perfect price transparency. The price of the fuel is clearly displayed at the moment of decision making. People can easily translate the value of a gallon of gasoline into tangible benefits in terms of miles travelled. This lies in marked contrast to the electricity sector, where customers have precious little knowledge as to the price of a kilowatt-hour, almost no grasp as to the useful value of this arcane energy unit,

[4] ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 37.

only see the cost of a decision to consume one until weeks after doing so, and lack the ability to disaggregate individual consumption decisions from a single, lump-sum bill. Rather than perpetuating this problem, the Commission should meet existing consumer expectations for price transparency regardless of their fuel choice and regardless of their fuel provider.

4. Intelligent Load Management

The ability to manage the PEV load intelligently will be essential if the Commission is to both minimize costs to the distribution system and reduce the marginal cost of electricity for all users through greater asset utilization. ComEd asserts: "Both residential and commercial charging stations, Level 2 and above, must be 'smart,' meaning the charging station must support communications with the utility. These communications include remote load management capability for the utility, such as the ability of the charging station to accept electricity price signals, and the ability to start/stop charging based on system load signals."[5] The Commission should consider how its regulatory paradigm will impact its ability to ensure this level of intelligent load management for all end-users.

Each of these enumerated examples will play a critical role in the successful integration of electric vehicles within the state of Illinois. Before exempting third-party charging service companies from regulation as utilities or Retail Electric Suppliers, the Commission should clearly identify other sources of authority upon which it will rely to ensure that these necessary actions and policies materialize.

III. IN ORDER TO FACILITATE THE CHARGING OF ELECTRIC VEHICLES THAT PROVIDES THE MAXIMUM SOCIETAL ENVIRONMENTAL AND ECONOMIC BENEFITS, WHAT MODIFICATIONS (IF ANY) SHOULD BE MADE TO EXISTING UTILITY RATES?

There is widespread agreement amongst parties that time-variant rates are needed to minimize distribution-level grid impacts, and in the longer term, to obviate the need for additional generation-level investments. Preliminary analysis by Pacific Gas & Electric estimates that the

[5] ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 35.

distribution system cost impacts of integrating vehicle charging will be 25 times greater if it occurs on-peak.[6] Thankfully, Illinois' utilities already have real-time pricing programs, which, as the analysis done by MidAmerican Energy demonstrates, could provide advantages over simple time-of-use rates that might cause artificial peaks at the beginning of off-peak periods.[7] ComEd states that 95% of customers who switched to real-time pricing have lower bills than they would have had they remained on flat rates.[8] However, ComEd also notes that, despite the fact the real-time rate has been available since 2007, only a vanishingly small number of customers have made the switch.[9] Staff inquiries into electric vehicle readiness in Oregon have noted similar results, with opt-in time-variant rates only securing around two percent of customers.[10] Clearly defaults matter.

Given the fact all customers will generally benefit if PEV charging is done on time-variant rates, the Commission should make such rates the default for PEV customers. Those PEV customers who, for whatever reason, do not wish to remain on time-variant rates would have the option to opt-out, but those that remain would be able to take advantage of low off-peak prices and minimize the impacts associated with their charging while doing so. Ameren and MidAmerican Energy note that some customers would have little incentive to make the switch to time-variant rates because they are either served under special space-heat or declining-block rates.[11] These rates already provide a perverse incentive to consume electricity. With the introduction of PEVs, they also provide a perverse incentive to charge when the disproportionately high costs of doing so will be borne by other customers. This underscores the need for the Commission to transition customers away from rates that provide perverse incentives and to make time-variant rates the default for PEV customers. Again, the Commission should articulate how it will ensure that time-variant rates will reach all end-users, including customers of Retail Electric Suppliers and third-party charging service companies.

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[6] CPUC Energy Division, *Revenue Allocation and Rate Design*, R. 09-08-009, September 10, 2010, p. 10.
[7] MidAmerican Energy, *Initial Assessment of the System Impact of Plug-in Electric* Vehicles, 2010, p.18.

[8] ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 55.

[9] *Id*.

[10] UM 1461, Staff Response to Commission Bench Request, February 10, 2011, p. 5.

[11] Ameren, "Initial Assessment," December 15, 2010, pp. 14-17; MidAmerican, "Initial Assessment of the System Impact of Plug-in Electric Vehicles," p. 23.

IV. WHAT METERING OPTIONS AND CHARGES SHOULD BE CONSIDERED WHILE TAKING INTO ACCOUNT THE EXISTENCE OF COMPETITIVE RETAIL SUPPLIERS?

As a preliminary matter, NRDC suggests the Commission adopt the following definitions of metering options to avoid confusion:

1. *Single Metering*

   Single metering arrangements measure and bill PEV load as part of the total customer load using the pre-existing utility meter.

2. *Separate Metering*

   Separate metering requires an additional meter dedicated to measuring PEV load. This arrangement measures PEV load as if the load were a separate service account, and enables the PEV load to be billed separately from other non-PEV load served on the premises.

3. *Sub-metering*

   This is similar to separate metering in that it uses a dedicated meter for the PEV load. However, the sub-meter is typically located downstream of the primary service meter, and could be embedded in otherwise necessary charging equipment, or even in the vehicle itself.

Already certified utility service meters, used in either separate or sub-metering arrangements, appear to be the only currently available meters that can facilitate separate billing of PEV load. However, such meters, especially when installed in a separate metering arrangement requiring a second service panel, can impose a significant expense, on the order of several hundred to several thousand dollars.[12] Accordingly, NRDC recommends that the Commission not require dedicated metering at this time. The California Public Utilities Commission has ordered the creation of a sub-metering protocol to develop lower cost alternatives.[13] The Illinois Commerce

[12] At this early stage of the market, the incremental cost of separate metering cannot be precisely defined, however, NRDC has good anecdotal information that separate metering results in significant incremental costs, as it requires a second service panel and complicates the installation of charging equipment.

[13] NRDC notes its disagreement with the California Public Utilities Commission's characterization of sub-metering as likely to be exclusively customer-owned and counsels the Illinois Commerce Commission to not make such a determination at this extremely early stage in the development of the market. If sub-metering emerges as a low-cost alternative, there

Commission should monitor this effort and others across the country that could result in the emergence of lower cost metering solutions.

Regarding the question of what "charges should be considered taking into account the existence of competitive retail suppliers," NRDC reiterates that the Commission should consider whether or not charges associated with the distribution portion of any customer's service would be sufficient to transmit the time-variant price signals necessary to minimize impacts to the distribution system.

V. WHAT COST CAUSATION AND RATE DESIGN MODIFICATIONS WILL BE REQUIRED TO HANDLE DISTRIBUTION UPGRADES FOR INCREASED PENETRATION OF HIGHER VOLTAGE AT-HOME CHARGING? WHICH COSTS, IF ANY, SHOULD BE SOCIALIZED AND WHY? ASSUMING THERE ARE COSTS TO BE SOCIALIZED, WHAT ARE THE PROPER METHODS FOR SUCH ALLOCATION?

NRDC recommends that the Commission focus its efforts on ensuring that there are benefits to be socialized, and not costs. In addition to environmental benefits, which will necessarily be socialized, PEVs could lower the marginal cost of energy for all customers. Analysis done by the Pacific Northwest National Laboratory shows that large numbers of PEVs charging during off-peak hours could significantly lower the marginal cost of energy. [14] This potential exists for utilities with very different market structures and generation assets. With the right policies in place, the potential financial gain from more efficient asset utilization could be greater than the costs of distribution upgrades. Accordingly, the Commission should adopt policies that promote price transparency and time-variant rates for all end-users, off-peak charging, charging at lower voltages, and intelligent load management.

The Commission should maintain existing cost allocation principles and avoid attempts to track and allocate costs associated with PEV integration to PEV users exclusively. No such load discrimination was practiced when comparably demanding loads, including hot tubs and air conditioners, which lack the environmental benefits associated with PEVs, were integrated into the

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seems to be little reason why utilities should not own such meters, just as they own existing meters serving the same purpose.

[14] Michael J. Scott Michael Kintner-Meyer Douglas B. Elliott William M. Warwick Pacific, *Impacts Assessment of Plug-In Hybrid Vehicles on Electric Utilities and Regional U.S. Power Grids: Part 2: Economic Assessment,* Northwest National Laboratory, November, 2007.

electrical grid. There is no rationale for attempting such load discrimination now. Furthermore, doing so presents questions of causation that simply cannot be answered. Asserting that a given PEV "caused" a transformer upgrade ignores all previously added loads which brought the transformer to the point of exceeding its capacity. Nevertheless, the impossibility of answering the cost-causation question for shared distribution assets should not prevent the Commission from directing utilities to conduct load research to ensure the most efficient integration of vehicle charging. In sum, costs that would normally be socialized should continue to be socialized and costs that would normally be allocated to individual customers should continue to be recovered accordingly. Attempting to do otherwise is intellectually indefensible and could undermine the Commission's efforts to reduce barriers to the widespread and successful integration of electric vehicles.

VI. WHAT PROCESS DO YOU RECOMMEND?

As discussed in the section of these comments regarding the appropriate regulatory paradigm, there are arguments for and against the need for legislative action. In contrast, the need for ICC action is self-evident. NRDC commends the Commission for beginning this process and encourages the ICC to see it through to its logical conclusion.

VII. ADDITIONAL INFORMATION THE COMMISSION SHOULD CONSIDER

A. With Automatic Rate Adjustment, Electric Vehicles Could Lower Rates for All Customers

As discussed above, research by the Pacific Northwest National Laboratory demonstrates the potential for large numbers of PEVs charging in off-peak hours to significantly reduce the marginal cost of energy. Absent revenue decoupling, utilities will retain the benefits of this "found margin" in the form of greater profits. With revenue decoupling in place, those benefits will be returned to all utility customers in the form of lower rates. A "lost margin recovery mechanism" will fail to adjust rates downward as electricity sales increase with PEV adoption. Decoupling authorized fixed cost recovery from the actual volume of electricity sales causes increases in sales to result in reduced rates for all customers by spreading only marginally increased fixed costs over significantly more kilowatt-hours sold. Furthermore, decoupling aligns utility incentives with the use of the most efficient vehicles and charging infrastructure by removing any profit-opportunity

from maximizing the volume of electricity needed for electric drive. As the Commission is aware, NRDC has proposed decoupling in ComEd's current rate case (10-0467).

B. The Commission Should Pursue Multiple Paths to Ensure Utility Notification

As discussed above, there is broad consensus that utility notification as to the location of planned vehicle charging stations is essential to facilitate service planning. NRDC agrees with CNT Energy and i-GO Car Sharing that notification is one part of a comprehensive process necessary to ensure a smooth deployment of electric vehicles.[15] NRDC also endorses the type of voluntary bilateral arrangements that utilities and automakers are currently undertaking to ensure that notification occurs during the new car purchase process. The Commission should also consider how notification will occur when cars are sold in the secondary market or when a vehicle owner moves, and may wish to evaluate California Senate Bill 859, which would leverage Department of Motor Vehicle records to accomplish this task.[16] The California Plug-in Electric Vehicle Collaborative, whose membership includes utilities, automakers, NGOs, charging service companies, and all the relevant state agencies, is also exploring how notification could be accomplished at scale.

C. Higher Power Level 2 Charging May Require Commission Action

"Level 2" encompasses rates of charge up to 19 kW. The impacts associated with charging do not increase linearly with the rate of charge. "Level 1" and lower power "Level 2" charging can be absorbed into most utility distribution systems with little impact, while higher power "Level 2" charging could be significantly more costly. It now appears that automakers see a marketing advantage in offering vehicles capable of increasingly high rates of charge. There may be times at which a customer will want to take full advantage of the capability to charge very rapidly, but it is likely unnecessary for normal, over-night charging needs, and could prove very expensive. Accordingly, the Commission may wish to consider means to encourage lower rates of charge when compatible with a customer's needs.

15 CNT Energy and I-GO Car Sharing Joint Comments on Utility EV Assessments January 21, 2011.

16 California Senate Bill859, 2011.

D. The Commission Should Use Electric Vehicles as a Means to Promote Additional Energy Efficiency and Clean Energy

Electrification of transportation presents a singular opportunity to raise the energy awareness of consumers in the electricity sector. Sixty-seven percent of participants in a yearlong study conducted by the University of California at Davis and BMW reported that driving an electric version of the Mini Cooper changed the way they think about energy.[17] Many installed solar panels, and undertook building energy efficient upgrades. Electric vehicles are themselves an energy efficiency upgrade. As discussed above, the utility sector could stand to gain much from the type of price transparency and energy awareness that exists in the transportation sector. Once people plug-in, they start thinking differently about the source of their electricity. The Commission should promote policies that couple vehicle electrification with renewable energy through "green tariffs" and distributed generation, as well as opportunities to promote additional building efficiency upgrades. Likewise the Commission should encourage policies that will continue to improve the environmental performance of the electrical grid so the environmental benefits of vehicle electrification grow accordingly.

E. Education and Outreach is Essential

Many parties, including the utilities, the Environmental Law and Policy Center, the Citizens Utility Board, CNT Energy and iGo note the critical role education and outreach will play in the successful integration of electric vehicles. NRDC agrees that such efforts will be essential and recommends that the Commission state as much in terms similar to those recently articulated by the California Public Utilities Commission:

> *a. Each utility has an obligation to use funds to provide its customers with information regarding the choices available for metering arrangements, rates, demand response programs, charging equipment, installation, safety, reliability, and off-peak charging.*
>
> *b. Each utility has an obligation to use funds for targeted PEV education and outreach to educate customers about the environmental and societal benefits of PEVs consistent with the state's policy goals related to the reduction of greenhouse gas emissions set forth in AB 32.* [18]

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[17] UC Davis Institute of Transportation Studies Research Report: *UCD-ITS-RR-11-05*, p. 71.

[18] California Public Utilities Commission, *Decision 11-07-029*, July 14, 2011, p. 88.

As noted above, the successful integration of electric vehicles is dependent upon the dedication of individuals trained to assist customers interested in making the switch to electric drive, as well as active coordination with local electricians, charging service companies, building owners, permitting agencies, and automakers.

VIII. CONCLUSION

NRDC thanks the Commission for its leadership in this critical area and anticipates continued involvement as Illinois prepares for the most exciting innovation in the transportation sector since the switch from steam to internal combustion engines.

Respectfully submitted,

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